GENERAL CONDITIONS

The single outstanding feature of the month, considering its subsequent effect, was the prolonged period of heavy rain over the central Mississippi Basin when the streams of the region were already at or near flood stage.

These rains were the direct cause of the unprecedented flood that is slowly passing down the lower reaches of the Mississippi and overland toward the Gulf of Mexico. The approximate area of land thus far inundated is 15,000 square miles.—*A. J. H.*

CYCLONES AND ANTICYCLONES

April showed a reduction in the number of barometric maxima and minima, 18 LOWS and 8 HIGHS being tracked. Rather sluggish conditions prevailed during the middle portion of the month; beginning with the 8th there was little relative change in the positions of the principal HIGHS and LOWS during six observation periods (three days) from western Europe westward to the middle Pacific Ocean. In this case the high-pressure area assumed a north-south position over the two oceans. As the polar air slowly drained southward, and pressure began to fall over high latitudes, a somewhat more normal movement began to develop.—*W. P. Day.*

WEATHER IN THE UNITED STATES

THE WEATHER ELEMENTS

By P. C. DAY, in Charge of Division

PRESSURE AND WINDS

The marked features of the weather during April, 1927, were the persistence of moderate cyclonic conditions over the Southwest during the first two decades, and the abnormally heavy precipitation resulting therefrom as these moved to the eastward over the middle and lower Mississippi Valley, resulting in the most disastrous floods ever experienced in that river from Cairo southward and in many of its southern tributaries.

With the beginning of the month an important cyclone was central over the lower Missouri and middle Mississippi Valleys, and heavy rains had fallen during the preceding 24 hours over much of those and near-by areas. This storm lost importance rapidly and during the following 24 hours moved to the Middle Atlantic States with much decreased precipitation.

On the morning of the 4th pressure was low over the vicinity of eastern Kansas and during the following 24 hours the center moved to the Lake Superior region attended by considerable rain over the Mississippi and Ohio Valleys and Great Lakes, the rain area extending during the following day into the more eastern districts, due to the formation of a second storm that moved northward off the immediate Atlantic coast from the Carolinas to New England.

From about the 7th to 16th, inclusive, a period of 10 days, the atmospheric pressure continued low over the southern Plains and precipitation, excessive at times, was of almost daily occurrence over the immediate Mississippi Valley, particularly in Arkansas and Missouri, the eastern portions of Oklahoma, Kansas, and Nebraska, nearly the whole of Illinois, portions of Iowa, the western parts of Kentucky and Tennessee, northern Mississippi, and parts of Louisiana. The total falls on the 13th and 14th were particularly heavy over Arkansas and portions of near-by States, many stations reporting more than 5 inches in the 48-hour period and some as much as 10 inches.

After an interval of a day or so, in some sections scarcely so long, precipitation again began over much of the region mentioned above and continued with only short interruptions until the beginning of the third decade. During this period 24-hour amounts of precipitation, particularly in Arkansas, frequently exceeded 5 inches and in some cases they were above 10 inches.

After the 21st, high pressure and clear weather prevailed over the area where precipitation had persisted for so long and such cyclones as crossed the country were confined to more northerly courses, until near the end when another low-pressure area central over Missouri on the morning of the 29th moved southeasterly to the southern Appalachian region by the following morning attended by some heavy rains in the Ohio Valley and lighter amounts over near-by areas.

Despite the heavy rains in the middle and lower Mississippi Valley and some near-by areas, no cyclone giving extensive precipitation pursued a well-defined course over any considerable distance, nor were the heavy rains usually attended by important depressions of the barometer.

Anticyclones were confined mainly to the Great Lakes region and eastward to the Middle Atlantic States, New England, and the Canadian Maritime Provinces. In fact during the first half, high pressure was nearly continuous over these areas. At the beginning of the last decade anticyclonic conditions appeared over the Rocky Mountain region and, moving eastward, favored fair weather over the central valleys and southeastern districts until near the end of the month when low pressure again overspread the Central and Eastern States.

The distribution of monthly mean pressure is shown on Chart VI; departures from normal are shown on the inset on Chart I, and the change from the previous month on the inset on Chart II.

The important destructive winds of the month were mainly of the local character attending thunderstorms and usually covered but small areas at any time. They were confined as a rule to an area extending from Texas northeastward to the Great Lakes and Ohio Valley, and occurred most frequently about the 11th to 14th and again on the 18th to 21st.

A number of tornadoes occurred during the month, mostly in Texas, Arkansas, Oklahoma, and Illinois. The tornado that struck Rocksprings, Tex., on the evening of the 12th was the most severe of the month, resulting in the loss of 74 lives and damage to property exceeding $1,000,000. A storm of tornadic character passing northeastward from the vicinity of St. Louis, Mo., toward and over Springfield, Ill., and thence toward Chicago, on the afternoon of the 19th, caused the loss of 21 lives and property damage considerably in excess of $1,000,000. A list of these with others of less importance, together with the details of additional wind, hail, and other damaging storms of the month appears at the end of this section.

TEMPERATURE

The major portions of the first and second decades had moderate temperature changes with daily averages mainly above normal over the central valleys and south-

ern districts, and mostly below normal in those from the Rocky Mountains westward, the week ending the 19th being quite cool over that region.

About the end of the second decade high pressure entered the upper Missouri Valley and moving southward and eastward brought the most important temperature changes of the month and the lowest readings from the States of Washington and Oregon southeastward to the Gulf and South Atlantic coasts as far north as Virginia. In portions of the northern Plateau regions the minimum temperatures on the 19th and 20th were in numerous instances the lowest of record for so late in April, and much damage resulted to early fruits in the large commercial orchards of that region, including portions of Utah and Colorado. As this cold area moved eastward freezing temperatures extended into the northern and middle sections of the Gulf States and here, as well as to the northward, much damage to fruit and early vegetation resulted. About the same time unusually high temperature prevailed over the Northeastern States, the maximum temperatures over the coast districts of New England on the 20th being the highest ever reported in April. The average temperature for the week ending the 26th was below normal over all portions of the country save the Northeastern States and the far West.

With the passing eastward of the cold area referred to above, warmer weather followed, and the last few days of the month were moderately warm over most of the country, though cooler weather had overspread the lower Missouri and upper Mississippi Valleys, the Great Lakes region, and other near-by areas at the end of the month, with light frost in exposed localities.

The mean temperatures were above the normal for April over the greater part of the country, as has been the case, particularly in the central valley and Gulf States, during the preceding months of the year. The monthly temperatures were well above normal over all southern districts from New Mexico eastward, a few stations reporting means nearly or quite as high as had ever previously occurred in April. Temperatures were mainly slightly lower than normal over the Northeastern States and locally near Lake Michigan and in the far Northwest, likewise over the western Canadian Provinces, but they were higher to the eastward.

The highest temperatures were recorded about the 18th to 20th from the upper Mississippi Valley eastward and southeastward to New England and the Middle Atlantic States and locally in the Southeast, and from the 25th to 28th over the districts west of the Mississippi River and in a few States immediately to the eastward. The highest recorded was 108° in southern California and temperatures about 100° were observed locally in several States of the Southwest.

The lowest temperatures, as stated elsewhere, occurred mostly from the 19th to 23d, but over New England on the 2d and 3d, in portions of the Middle Atlantic States on the 10th and 11th, and over the Southwest from the 12th to 14th. The lowest reported was −18° in Wyoming with −16° in Colorado, −12° in California, and −10° in Idaho, all at exposed points in the mountains.

PRECIPITATION

The rains in the middle Mississippi Valley and near-by areas during the first two decades of April probably exceeded all previous records in that locality for total amounts of fall and length of period during which rain was of almost daily occurrence. In much of this area monthly amounts ranged from 10 to 15 inches, reaching more than 20 inches in some places, with plus departures ranging up to as much as 18 inches. Arkansas had a departure for the entire State of over 8 inches, Missouri had over 5 inches, and near-by areas of adjacent States had similar excesses. Over much of this area the precipitation during March had also been far in excess of the normal fall. As a result of these heavy rains the rivers of that section were in flood during the greater part of the month and some had the highest stages ever known.

Aside from the area referred to above, most of the central valleys, as well as the Middle Atlantic States, had precipitation above the normal. In the Southeastern States, however, the month was mainly quite dry, and similar conditions existed in New England and portions of the Lake region. In the far West precipitation was mainly less than usual, and there was a considerable deficiency over the central and west Gulf coast, save in the vicinity of New Orleans where a large excess was received. At points in Florida, the Carolinas, and New England the month was among the driest of record for April.

SNOWFALL

Some unusually heavy and long continued snows occurred in the northern Rocky Mountains during the first half of the second decade. This was most pronounced in Wyoming and near-by areas. At Cheyenne snow was of daily occurrence from the 10th to 15th, and similar conditions existed at numerous other points in that State, with total falls up to 3 feet or more. In central and southern Montana the depths ranged from 10 to 40 inches. In the Black Hills of South Dakota and western Nebraska the depths ranged up to 2 or 3 feet, with a small area in northwestern Nebraska of more than 4 feet, the greatest depth ever known in that locality. This period was without important wind movement and hence there was little drifting, and save for the unusual depth there was no great interference with traffic, as the weather continued mild and the snow soon disappeared.

Over the remaining mountain sections of the West the snowfall was mainly greater than usually occurs in April, particularly in the central and northern districts, and the outlook for water during the dry season is probably better than usual in the districts where water is mostly needed.

Over the more eastern districts some snow occurred over considerable areas, but the amounts were mainly small. The distribution is graphically shown as usual on Chart VII of this issue.

RELATIVE HUMIDITY

Generally speaking the average relative humidity was above the normal save from the upper Lakes to New England, locally over the Southeastern States, and mainly from the Rocky Mountains westward, though in this region there were areas with averages above the normal, this being particularly the case at points in Arizona and Nevada. At points in New England and New York the percentages of relative humidity were the least of record for April, and about the 11th and 12th the humidity was remarkably low over the coast districts, Providence, R. I., reporting 9 per cent at noon of the 12th and Boston 10 per cent on the same date, these probably being the lowest individual values ever observed at those stations. At points in the lower Missouri and middle Mississippi Valleys the percentages ranged from 5 per cent to 15 per cent above the normal.